CERTIFICATE OF TRANSMISSION BY FACSIMILE (37 CFR 1.8) Applicant(s): William N. Partlo, et al.			Docket No. 2003-0092-01
Application No. 10/815,387	Filing Date March 31, 2004	Examiner Dung T. Nguyen	Group Art Unit 2828

Invention: GAS DISCHARGE LASER CHAMBER IMPROVEMENTS - Appeal Brief (28 pgs); Transmittal of Appeal Brief (1 pg); Facsimile Cover Sheet (1 pg). TOTAL PAGES 30

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TRANSMITTAL OF APPEAL BRIEF (Large Entity)	Docket No. 2003-0092-01

In Re Application Of: William N. Partlo, et al.

Application No.	Filing Date	Examiner	Customer No.	Group Art Unit	Confirmation No.
10/815,387	March 31, 2004	Dung T. Nguyen	21773	2828	7575

Invention: **GAS DISCHARGE LASER CHAMBER IMPROVEMENTS**

COMMISSIONER FOR PATENTS:

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:
William N. Partlo, et al.

Serial No.: 10/815,387

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APPLICANTS' APPEAL BRIEF

Applicants filed a Notice of Appeal in the above-captioned Patent Application on March 17, 2008, Responsive to a Final Office Action dated November 16, 2007.

Applicants hereby present Applicants' Appeal Brief.

(1) Real Party In Interest

The real party in interest in the above-captioned Appeal is Cymer, Inc. a corporation of the state Nevada and assignee of the above-captioned Patent Application containing the claims that are the subject of this Appeal.

(2) Related Appeals and Interferences

There are no related appeals or interferences.

(3) Status of the Claims

Claims 1-64 are pending in the above-captioned Patent Application. Claims 65-102 were previously withdrawn. Claims 1-48 stand rejected under 35 USC §102. Claim 1 is an independent claim and claims 2-48 depend directly or indirectly from claim 1. Claims 49-64 are indicated as having allowable subject matter but are objected to for depending from a rejected base claim.

(4) Status of Amendments

An Amendment After Final was filed by Applicants after the Final Office Action dated November 16, 2007, and entered by the Examiner. In the view of the Examiner, as expressed in the Advisory Action dated March 11, 2008, the Amendment did not put any disputed claims in condition for allowance.

(5) Summary of the Claimed Subject Matter

The claimed subject matter relates to a "gas discharge laser UV light source comprising a gas discharge chamber comprising an interior wall comprising a vertical wall and an adjacent bottom wall; a gas circulation fan ... [and] an in-chamber dust trap positioned in a region of low gas flow." (Claim 1)

As the Specification in the above-captioned application [referenced to the paragraphs in the U.S. Published Patent Application No. 2005/0226301, published on October 13, 2005] explains:

... According to aspects of an embodiment of the present invention applicants have proposed additional, low cost, easily implemented and very reliable means for debris removal from the gas circulating within the gas circulation flow path in the laser gas discharge chamber. ... [¶0006]

...

Also contained in the chamber interior 26, e.g., along the horizontal bottom interior wall 29 of the bottom 24 of the chamber 20 may be, e.g., a dust trap 100. It will be understood that by dust is meant the various forms of debris, e.g., mostly metal fluoride material, that circulates with the gas circulation and appears to the naked eye to be dust-like or lint-like. [¶0031]

The dust trap 100 according to an aspect of an embodiment of the present invention may be illustrated by reference to FIGS. 2A-D as an example. As shown in FIGS. 2A-D, the dust trap 100 may be comprised of at least one meshed element, e.g., a wire mesh 102 ... . The meshed ... members ... may form mesh openings ... . [¶0032]

...

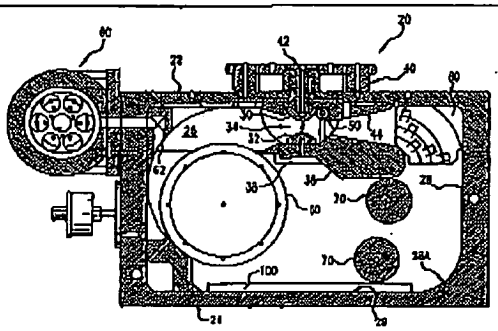


FIG.1

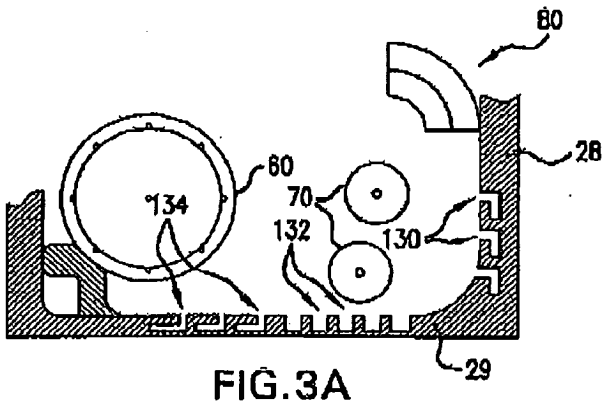


FIG.3A

... In operation with the ... traps, e.g., 100, 100', 100" in and/or along the walls of the chamber, essentially in the boundary flow region, the boundary layer flow ... may, e.g., be disrupted in such a way that particles of debris (so-called dust) are accelerated into the ... meshed elements in the dust traps, e.g., 100, 100'

and 100", and once inside essentially cannot return to the gas flow inside the chamber interior 26. ... [¶0039]

This so-called boundary layer effect is taken advantage of by Applicants ... [because] the meshed element, e.g., 102 openings, e.g., 106 presented to the flow 120, e.g., in the boundary layer present an opportunity for debris to precipitate out of the flow. ... [¶0040]

FIGS. 6A-C illustrate the operation dust traps 100-100" according to aspects of an embodiment of the present invention. It will be understood ... that the gas circulation in the generally circular circulation path referenced above is of relatively high velocities, e.g., measured at points in the cross-section of the circulation path on the order of tens of meters per second, determined, e.g., by the amount of gas flow necessary through the discharge region ... . More toward the boundaries of the container in which the gas is circulating, e.g., the wall sections 28, 29, due, e.g., to friction of the moving gas along these boundary portions, the gas flow slows down until its profile at the surface of the boundary element, e.g., interior wall 28 or 29 [goes] to zero or almost zero. [¶0041]

FIG. 5 illustrates an aspect of an embodiment of the present invention wherein a dust trap 100" lies along a wall, e.g., wall 28 and the bottom 29 of the chamber interior 26. [¶0042]

Applicants have found that ... the floating debris being circulated with the laser gas in the gas circulation path essentially all collects in the dust collector, e.g., a dust collector 100 on the floor of the chamber 20 and does not thereafter significantly migrate or get shocked back into the gas circulation flow path. In the past, Applicants believe that dust tended to precipitate to the bottom of the chamber, but that various acoustic and other shock wave and vibrational disturbances then periodically entrained the dust, or significant quantities of it, back into the gas circulation path. A dust trap ... virtually eliminate[s] the reintrainment of dust collected in the dust traps ... .[¶0043]

(6) Grounds for Rejection

Claims 1-48 have been rejected under 35 U.S.C., §102 (b) as being anticipated by the Japanese Published Abstract 60187073, and specifically, FIG. 2 in the Japanese language version of the published Patent Application No. JP59041914, filed on March 7, 1984, and published on September 24, 1985 ("Sato").

(7) Argument

In order to be an anticipating reference under 35 U.S.C. §102 (b) the reference must expressly or inherently disclose each and every element of the claim at issue. M.P.E.P. §2131 *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987). The Examiner has not asserted inherency as a way to utilize Sato as an anticipating reference.

The Examiner has taken the position in the Final Office Action with respect to Claims 1 and 2 that FIG. 2 of Sato discloses a:

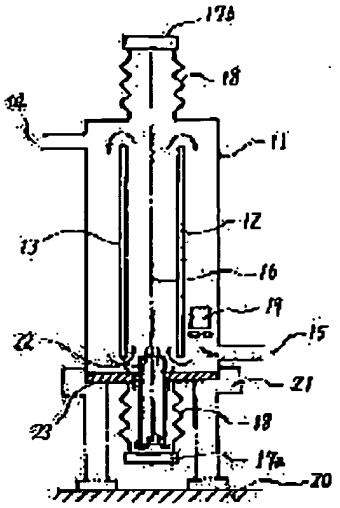
gas discharge chamber 11 comprising an interior wall comprising a vertical wall and an adjacent bottom wall;

a gas circulation fan 19 creating gas flow path adjacent the interior vertical wall and the adjacent bottom wall; [and,]

an in-chamber dust trap 23 positioned a region of low gas flow.

With respect to claims 3-16, the Examiner has taken the position FIG. 2 in Sato discloses "the dust trap comprises a plurality of meshed screens (filters)."

With respect to claims 17-48 the Examiner has taken the position that FIG. 2 of Sato discloses "the dust trap extends along the bottom interior wall and a vertical portion of the interior wall."



Applicants respectfully submit that the Examiner is incorrect in each of these interpretations of the disclosure of Sato. Regarding claim 1, Sato, at least, does not disclose a "dust trap," but rather a "dust filter". In addition, the filter of Sato, even if it were a "dust trap" as claimed, which it is not, it is not an "in-chamber dust trap". Further, the filter of Sato, even if it were a "dust trap" as claimed, which it is not, it is not "positioned in a region of low gas flow."[1]

With respect to claims 3-16, the filter of Sato, even if it were a "dust trap" as claimed, which it is not, is not disclosed to comprise "a plurality of meshed screens."

With respect to claims 17-48, the filter of Sato, even if it were a "dust trap" as claimed, which it is not, is not disclosed to "extend[] along the bottom interior wall and a vertical portion of the interior wall."

Sato does not show a dust trap at all, as that term is utilized and defined in the Specification of the above-captioned Patent Application. Sato discloses a dust filter through which the entire gas flow from the fan 19 that circulates in the bellows 18 flows.

---

[1] The Examiner has taken the position in the Advisory Action that:

> Applicant did not specifically recite the limitation of 'a region of low gas flow' in the a specific location of the laser chamber (meaning a region of low gas flow may be anywhere in the chamber).

Applicants do not understand the Examiner to have previously made a rejection based on 35 U.S.C. §112, but if this statement is such a rejection, Applicants submit that the above-noted portions of the Specification of the above-referenced Patent Application adequately describe what is meant by a "region of low gas flow" as opposed to the main gas circulation path and where they might exist in the chamber.

The Examiner also referred to an argument previously made by Applicants that gave an example of a low flow region. However, this does not limit the interpretation of the claims to only such an example. Low gas flow regions outside of the main gas circulation path may, as explained in the Specification, occur in many places within the chamber, particularly along the walls of the chamber.

Thus, the filter of Sato is truly a filter and not a trap, as that term is utilized and defined in the Specification of the above-captioned application. A filter has an input and an output, in the case of Sato, through which all of the circulating fluid entering the external bellows 18 must pass to get from the output of the circulating fan back to its input. It is an obstacle to the circulation function being performed by the fan and increases the power required for the fan to maintain a desired circulation rate, simply by the presence of the filter in the circulation path. The dust trap(s) of the subject matter being claimed have only an input and not an output through which circulating fluid flows.[2]

The filter 23 of Sato, even if considered a dust trap, which it is not, is also not in the claimed position of "in chamber." At best it is within a wall separating the laser chamber from the interior of the bellows 18. The filter of Sato it is between the chamber 11 and the interior region of the external bellows 18.

In addition, Sato does not disclose a dust trap that is "positioned in a region of low gas flow", as that term is also utilized and defined in the Specification of the above-referenced Patent Application. The filter 23 in Sato is positioned directly in the flow path of the gas in the laser interior being circulated by the fan 19 to the interior of the bellows 18 and back into the laser chamber 11. All the gas in the circulation path going to the bellows 18 interior must pass through the filter 23 in order to reach the return of the intake of the fan 19 inside the chamber 11 (passing through the flow controller 22 on the way). That is, the flow of the gas has to exit chamber 11 through the filter 23, and then enter the flow controller 22 in the vicinity of the resonator rear mirror 17a in order to get back to the fan 19 for further recirculation.

Thus, the filter 23 of Sato, is positioned in a region of high gas flow and does not work the same way, nor achieve the benefits of, the claimed dust trap, as described in the above referenced Application. It suffers from the same infirmity of prior art dust filters positioned in the gas flow path, i.e., increased pressure drop and slowing of gas circulation through the filter, and thus around the chamber if the claimed subject matter here were applied as in Sato. This forced flow through the filter, from a high pressure

[2] Of course some dust/debris may occasionally back up out of the dust trap opening as described in the Specification of the above referenced patent application, however, this is not the same as being forced by such as a gas circulation fan into a filter input opening, through the filter and out of a filter output opening, with all the attendant problems that placing such a filter in the circulation path entails.

side to the lower pressure side, increases the power requirements to maintain the same gas circulation flow in the laser chamber, as can be achieved without such a filter in place, or as in Sato between the chamber 11 and bellows 18.

The Examiner's position with respect to claim 2 that the filter 23 of Sato is "positioned along an interior wall of the laser chamber 11 of Sato", is also incorrect.

At best, the illustration of FIG. 2 in Sato shows a filter 23 positioned in the lower wall of the laser chamber, or forming the entire lower wall of the chamber.[3] Thus, at worst, FIG. 2 of Sato shows a filter 23 that is the entire lower wall of the chamber (which cannot work as just explained), or is formed in the lower wall, and not the claimed "positioned along." This is especially true where claim 2 is read in light of the limitation in claim 1 that the dust trap is "in chamber".

For these reasons the rejection of claims 1 and 2 under 35 U.S.C. §102 as anticipated by Sato are improper.

In any event, claim 2 should be allowed as depending from an allowable claim, not anticipated by Sato, as explained above. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988).

The Examiner's position as to claims 3-16, that FIG. 2 of Sato discloses that the "dust trap comprises a plurality of meshed screens" is incorrect. In the first place, the Abstract, even in the referenced FIG. 2, describes no details of the filter 23, whether it is meshed wire, or otherwise. The only thing shown is a cross section of a wall, and even that is confusing, since, as noted above, the entire wall cannot be the filter element 23 of Sato. At best, the filter 23 is shown to be an annular unit extending around the circumference of whatever the shape of the flow controller 22 is, cylindrical or whatever, and extending out to the boundary of the interior of the bellows 18, formed by the bellows 18 itself. As such, it is a single annular filter and not as the Examiner suggests a plurality of anything, much less a plurality of wire meshes. For these reasons the rejection of claims 3-16, as anticipated by Sato, are improper.

---

[3] Applicants believe that this cannot be the case, even though the entire lower wall is cross-hashed in FIG. 2, lest the gas in the laser chamber of Sato escape through the filter element around the outside of the bellows 18, which clearly cannot be intended. It is apparent that the cross-hashed lower wall is intended to block the flow of gas to the surroundings, and the filter 23 is only positioned in the lower wall, in a position to allow gas flow into the bellows 18 containing the rear resonator mirror 17a, and then back to the main chamber 11 through the flow controller 22.

In any event, claims 3-16 should be allowed, along with claim 1, which is not anticipated by Sato. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988).

As to claims 17-48, the Examiner's position that FIG. 2 of Sato "shows a dust trap that extends along the bottom interior wall and a vertical portion of the interior wall" is incorrect. As explained above, at most in support of the Examiner's position, Sato shows a filter 23 that forms the entire bottom wall of the chamber 11, and does not extend along a vertical wall of the chamber. Even if, contrary to what is noted above as to the positioning and extent of the Sato filter, the filter 23 of Sato forms the entire bottom wall of the laser chamber 11 of Sato, the Sato filter is not shown to extend along any vertical portion of wall of the chamber 11. Assuming that the disclosure of Sato is consistent with what Applicants assert is the only way the Sato laser chamber with bellows extension 18 for a mirror 17a can be made to work properly, i.e., discloses a filter that is bounded on one side by the flow controller 22 and on the other by the extent of the bellows 18, then the filter 23 is merely within the bottom wall, the extent of which wall is intermediate the chamber 11 and interior of the bellows 18. Therefore, not only does the Sato filter 23 not extend along a vertical portion of the chamber wall, it does not even touch the chamber wall.

For these reasons, the rejections of claims 17-48, as anticipated by Sato, are improper.

In any event, claims 17-48 should be allowed, along with claim 1, which is not anticipated by Sato. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988).

Conclusion

Applicants submit that the above-noted arguments show that the Examiner's rejections of claims 1-48 are improper, and the Board is respectfully requested to instruct the Examiner to withdraw the rejections to claims 1-48, allow claims 1-48, and remove the objections to claims 49-64.

Applicants hereby authorize the Commissioner to charge the Deposit Account of Applicants assignee CYMER, Inc., Deposit Account No. 03-4060, in the amount of $510.00 for the filing of this Appeal Brief. Applicants do not believe that any other fees or charges are due for the consideration of this Appeal Brief, but in the event there are, the Commissioner is also authorized to charge the referenced Deposit Account.

Respectfully submitted,

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Atty. Docket No. 2003-0092-01
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICANTS' APPEAL BRIEF

(8) Claims Appendix

1. (previously presented) A high power high repetition rate gas discharge laser UV light source comprising:

a gas discharge chamber comprising an interior wall comprising a vertical wall and an adjacent bottom wall;

a gas circulation fan creating a gas flow path adjacent the interior vertical wall and the adjacent bottom wall;

an in-chamber dust trap positioned in a region of low gas flow.

2. (previously presented) The apparatus of claim 1 further comprising:

the dust trap is positioned along an interior wall.

3. (original) The apparatus of claim 1 further comprising:

the dust trap comprises at least one meshed screen.

4. (original) The apparatus of claim 2 further comprising:

the dust trap comprises at least one meshed screen.

5. (original) The apparatus of claim 1 further comprising:
the dust trap comprises a plurality of meshed screens.

6. (original) The apparatus of claim 2 further comprising:
the dust trap comprises a plurality of meshed screens.

7. (original) The apparatus of claim 3 further comprising:
the dust trap comprises a plurality of meshed screens.

8. (original) The apparatus of claim 4 further comprising:
the dust trap comprises a plurality of meshed screens.

9. (original) The apparatus of claim 1 further comprising:
the dust trap comprises at least two different gauge meshed screens.

10. (original) The apparatus of claim 2 further comprising:
the dust trap comprises at least two different gauge meshed screens.

11. (original) The apparatus of claim 3 further comprising:
the dust trap comprises at least two different gauge meshed screens.

12. (original) The apparatus of claim 4 further comprising:
the dust trap comprises at least two different gauge meshed screens.

13. (original) The apparatus of claim 5 further comprising:
the dust trap comprises at least two different gauge meshed screens.

14. (original) The apparatus of claim 6 further comprising:
the dust trap comprises at least two different gauge meshed screens.

15. (original) The apparatus of claim 7 further comprising:
the dust trap comprises at least two different gauge meshed screens.

16. (original) The apparatus of claim 8 further comprising:
the dust trap comprises at least two different gauge meshed screens.

17. (original) The apparatus of claim 1 further comprising:
the dust trap extends along the bottom interior wall of the chamber.

18. (original) The apparatus of claim 2 further comprising:
the dust trap extends along the bottom interior wall of the chamber.

19. (original) The apparatus of claim 3 further comprising:
the dust trap extends along the bottom interior wall of the chamber.

20. (original) The apparatus of claim 4 further comprising:
the dust trap extends along the bottom interior wall of the chamber.

21. (original) The apparatus of claim 5 further comprising:
the dust trap extends along the bottom interior wall of the chamber.

22. (original) The apparatus of claim 6 further comprising:
the dust trap extends along the bottom interior wall of the chamber.

23. (original) The apparatus of claim 7 further comprising:
the dust trap extends along the bottom interior wall of the chamber.

24. (original) The apparatus of claim 8 further comprising:
the dust trap extends along the bottom interior wall of the chamber.

25. (original) The apparatus of claim 9 further comprising:

the dust trap extends along the bottom interior wall of the chamber.

26. (original) The apparatus of claim 10 further comprising:
the dust trap extends along the bottom interior wall of the chamber.

27. (original) The apparatus of claim 11 further comprising:
the dust trap extends along the bottom interior wall of the chamber.

28. (original) The apparatus of claim 12 further comprising:
the dust trap extends along the bottom interior wall of the chamber.

29. (original) The apparatus of claim 13 further comprising:
the dust trap extends along the bottom interior wall of the chamber.

30. (original) The apparatus of claim 14 further comprising:
the dust trap extends along the bottom interior wall of the chamber.

31. (original) The apparatus of claim 15 further comprising:
the dust trap extends along the bottom interior wall of the chamber.

32. (original) The apparatus of claim 16 further comprising:
the dust trap extends along the bottom interior wall of the chamber.

33. (original) The apparatus of claim 17 further comprising:
the dust trap extends along a vertical portion of the interior wall.

34. (original) The apparatus of claim 18 further comprising:
the dust trap extends along a vertical portion of the interior wall.

35. (original) The apparatus of claim 19 further comprising:
the dust trap extends along a vertical portion of the interior wall.

36. (original) The apparatus of claim 20 further comprising:
the dust trap extends along a vertical portion of the interior wall.

37. (original) The apparatus of claim 21 further comprising:
the dust trap extends along a vertical portion of the interior wall.

38. (original) The apparatus of claim 22 further comprising:
the dust trap extends along a vertical portion of the interior wall.

39. (original) The apparatus of claim 23 further comprising:
the dust trap extends along a vertical portion of the interior wall.

40. (original) The apparatus of claim 24 further comprising:
the dust trap extends along a vertical portion of the interior wall.

41. (original) The apparatus of claim 25 further comprising:
the dust trap extends along a vertical portion of the interior wall.

42. (original) The apparatus of claim 26 further comprising:
the dust trap extends along a vertical portion of the interior wall.

43. (original) The apparatus of claim 27 further comprising:
the dust trap extends along a vertical portion of the interior wall.

44. (original) The apparatus of claim 28 further comprising:
the dust trap extends along a vertical portion of the interior wall.

45. (original) The apparatus of claim 29 further comprising:
the dust trap extends along a vertical portion of the interior wall.

46. (previously presented) The apparatus of claim 30 further comprising:
the dust trap extends along a vertical portion of the interior wall.

47. (previously presented) The apparatus of claim 31 further comprising:
the dust trap extends along a vertical portion of the interior wall.

48. (previously presented) The apparatus of claim 32 further comprising:
the dust trap extends along a vertical portion of the interior wall.

49. (previously presented) The apparatus of claim 1 further comprising:
the dust trap comprises:
a first meshed screen having a first gauge;
a second meshed screen having a second gauge smaller than the first gauge;
the second meshed screen intermediate the first meshed screen and the interior wall.

50. (previously presented) The apparatus of claim 2 further comprising:
the dust trap comprises:
a first meshed screen having a first gauge;
a second meshed screen having a second gauge smaller than the first gauge;
the second meshed screen intermediate the first meshed screen and the interior wall.

51. (previously presented) The apparatus of claim 3 further comprising:
the dust trap comprises:
a first meshed screen having a first gauge;
a second meshed screen having a second gauge smaller than the first gauge;
the second meshed screen intermediate the first meshed screen and the interior wall.

52. (previously presented) The apparatus of claim 4 further comprising:

the dust trap comprises:

a first meshed screen having a first gauge;

a second meshed screen having a second gauge smaller than the first gauge;

the second meshed screen intermediate the first meshed screen and the interior wall.

53. (previously presented) The apparatus of claim 5 further comprising:

the dust trap comprises:

a first meshed screen having a first gauge;

a second meshed screen having a second gauge smaller than the first gauge;

the second meshed screen intermediate the first meshed screen and the interior wall.

54. (previously presented) The apparatus of claim 6 further comprising:

the dust trap comprises:

a first meshed screen having a first gauge;

a second meshed screen having a second gauge smaller than the first gauge;

the second meshed screen intermediate the first meshed screen and the interior wall.

55. (previously presented) The apparatus of claim 7 further comprising:

the dust trap comprises:

a first meshed screen having a first gauge;

a second meshed screen having a second gauge smaller than the first gauge;

the second meshed screen intermediate the first meshed screen and the interior wall.

56. (previously presented) The apparatus of claim 8 further comprising:

the dust trap comprises:

a first meshed screen having a first gauge;

a second meshed screen having a second gauge smaller than the first gauge;

the second meshed screen intermediate the first meshed screen and the interior wall.

57. (previously presented) The apparatus of claim 9 further comprising:

the dust trap comprises:

a first meshed screen having a first gauge;

a second meshed screen having a second gauge smaller than the first gauge;

the second meshed screen intermediate the first meshed screen and the interior wall.

58. (previously presented) The apparatus of claim 10 further comprising:

the dust trap comprises:

a first meshed screen having a first gauge;

a second meshed screen having a second gauge smaller than the first gauge;

the second meshed screen intermediate the first meshed screen and the interior wall.

59. (previously presented) The apparatus of claim 11 further comprising:

the dust trap comprises:

a first meshed screen having a first gauge;

a second meshed screen having a second gauge smaller than the first gauge;

the second meshed screen intermediate the first meshed screen and the interior wall.

60. (previously presented) The apparatus of claim 12 further comprising:

the dust trap comprises:

a first meshed screen having a first gauge;

a second meshed screen having a second gauge smaller than the first gauge;

the second meshed screen intermediate the first meshed screen and the interior wall.

61. (previously presented) The apparatus of claim 13 further comprising:

the dust trap comprises:

a first meshed screen having a first gauge;

a second meshed screen having a second gauge smaller than the first gauge;

the second meshed screen intermediate the first meshed screen and the interior wall.

62. (previously presented) The apparatus of claim 14 further comprising:

the dust trap comprises:

a first meshed screen having a first gauge;

a second meshed screen having a second gauge smaller than the first gauge;

the second meshed screen intermediate the first meshed screen and the interior wall.

63. (previously presented) The apparatus of claim 15 further comprising:

the dust trap comprises:

a first meshed screen having a first gauge;

a second meshed screen having a second gauge smaller than the first gauge;

the second meshed screen intermediate the first meshed screen and the interior wall.

64. (previously presented) The apparatus of claim 16 further comprising:

the dust trap comprises:

a first meshed screen having a first gauge;

a second meshed screen having a second gauge smaller than the first gauge;

the second meshed screen intermediate the first meshed screen and the interior wall.

65. (withdrawn) The apparatus of claim 1 further comprising

the dust trap comprises:

a plurality of dust collecting recesses in at least one of the vertical interior wall and the bottom wall of the chamber.

66. (withdrawn) The apparatus of claim 65 further comprising:

a plurality of dust collecting recesses in the vertical interior wall and the bottom wall.

67. (withdrawn) The apparatus of claim 65 further comprising:

the recesses are selected from a group comprising a one-part recess and a multi-part recess.

68. (withdrawn) The apparatus of claim 66 further comprising:

the recesses are selected from a group comprising a one-part recess and a multi-part recess.

69. (withdrawn) The apparatus of claim 67 further comprising:

the multi-part recess comprises two sections angled with respect to each other.

70. (withdrawn) The apparatus of claim 68 further comprising:

the multi-part recess comprises two sections angled with respect to each other.

71. (withdrawn) The apparatus of claim 1 further comprising:

the dust trap comprises:

a pressure trap positioned between a portion of a main insulator and an interior wall of the chamber.

72. (withdrawn) A high power high repetition rate gas discharge laser UV light source comprising:

a gas discharge chamber;

a gas circulating fan comprising a cross-flow fan;

a fan cutoff comprising:

a vortex control pocket.

73. (withdrawn) The apparatus of claim 72 further comprising:

the vortex control pocket is positioned and shaped to shift the vortex on the output of the crossflow fan so as to allow greater pressure across the fan for a given volume of flow through the fan.

74. (withdrawn) A high power high repetition rate gas discharge laser UV light source comprising:

a preionization mechanism comprising a preionization tube containing a ground rod within an elongated opening in the preionization tube;

the ground rod comprising a rod made of a conductive material and having a positioning plug at each end of the ground rod; and,

a compliant member absorbing longitudinal thermal expansion of the ground rod without significant transverse movement in the remainder of the ground rod.

75. (withdrawn) The apparatus of claim 74 further comprising:

the compliant member comprises:

a plurality of interleaving slits cut into the ground rod along a longitudinal axis of the ground rod.

76. (withdrawn) The apparatus of claim 74 further comprising:

the compliant member comprises:

at least one reverse bend element.

77. (withdrawn) A high power high repetition rate gas discharge laser UV light source operating in a burst mode comprising:

a preionization mechanism;

an automatic preionization shut-off mechanism that reduce preionization essentially to zero at a preselected time during a burst of pulses prior to the last pulse in the burst of pulses.

78. (withdrawn) The apparatus of claim 77 further comprising:

the automatic preionization shut-off mechanism comprises a charge accumulation device timed to accumulate sufficient charge to cease preionization at a selected time.

79. (withdrawn) The apparatus of claim 77 further comprising:

the automatic preionization shut-off mechanism comprises an RC network connected between a high voltage connected to the preionization mechanism and a common voltage.

80. (withdrawn) The apparatus of claim 78 further comprising:

the automatic preionization shut-off mechanism comprises an RC network connected between a high voltage connected to the preionization mechanism and a common voltage.

81. (withdrawn) The apparatus of claim 77 further comprising:

the automatic preionization shut-off mechanism is timed to essentially to zero after the first few pulses in a burst.

82. (withdrawn) The apparatus of claim 78 further comprising:

the automatic preionization shut-off mechanism is timed to essentially to zero after the first few pulses in a burst.

83. (withdrawn) The apparatus of claim 79 further comprising:

the automatic preionization shut-off mechanism is timed to essentially to zero after the first few pulses in a burst.

84. (withdrawn) The apparatus of claim 80 further comprising:

the automatic preionization shut-off mechanism is timed to essentially to zero after the first few pulses in a burst.

85. (withdrawn) A high power high repetition rate gas discharge laser UV light source including a pair of gas discharge electrodes in a gas discharge chamber comprising:

a preionization mechanism comprising:

a ground rod;

a switch mechanism connecting the ground rod to ground at a selected time prior to a discharge between the pair of gas discharge electrodes.

86. (withdrawn) The apparatus of claim 85 further comprising:

the switch mechanism comprises a saturable magnetic switch connected to a high voltage supply to the pair of electrodes.

87. (withdrawn) The apparatus of claim 85 further comprising:

the switch mechanism comprises a non-active inductive element connected to the ground rod.

88. (withdrawn) A high power high repetition rate gas discharge laser UV light source including a pair of gas discharge electrodes in a gas discharge chamber defining a gas discharge region having a longitudinal centerline axis and a horizontal cross-sectional axis comprising:

a preionization mechanism;

a focusing element focusing the preionization radiation to a selected portion of the discharge in relation to the longitudinal centerline axis and the cross-sectional axis.

89. (withdrawn) The apparatus of claim 88 further comprising:

the focusing element comprising a section of an elliptical cylinder having a cylindrical axis generally aligned to the longitudinal centerline axis of the electrodes and a first focus generally aligned with a centerline axis of the preionization mechanism and a second focus at the selected portion of the discharge.

90. (withdrawn) The apparatus of claim 88 further comprising:

a main insulator formed to contain the focusing element.

91. (withdrawn) The apparatus of claim 89 further comprising:

a main insulator formed to contain the focusing element.

92. (withdrawn) The apparatus of claim 90 further comprising:

the main insulator comprising a polished surface forming the focusing element.

93. (withdrawn) The apparatus of claim 91 further comprising:

the main insulator comprising a polished surface forming the focusing element.

94. (withdrawn) A method of providing debris removal from a high power high repetition rate gas discharge laser UV light source comprising:

providing a gas discharge chamber comprising an interior wall comprising a vertical wall and an adjacent bottom wall;

creating with a gas circulation fan a gas flow path adjacent the interior vertical wall and the adjacent bottom wall;

providing an in-chamber dust trap positioned a region of low gas flow.

95. (withdrawn) The method of claim 94 further comprising:

providing the in-chamber dust trap along the interior wall.

96. (withdrawn) A method of providing acoustic resonance mitigation in a high power high repetition rate gas discharge laser UV light source comprising a gas discharge

chamber including an elongated gas discharge region defining a longitudinal discharge axis, comprising the steps of:

providing an elongated baffle plate having an irregularly shaped acoustic wave dispersive facing and attaching this baffle plate to a portion of the chamber generally parallel to the longitudinal gas discharge region and positioned at a distance from the longitudinal gas discharge region based upon the frequency of a resonance peak that is desired to be reduced.

97. (withdrawn) A method of providing acoustic resonance mitigation in a high power high repetition rate gas discharge laser UV light source comprising a gas discharge chamber including an elongated gas discharge region defining a longitudinal discharge axis, comprising the steps of:

randomizing the gas discharge pulse repetition rate over time while maintaining an average gas discharge pulse repetition rate over time.

98. (withdrawn) A method of providing acoustic resonance mitigation in a high power high repetition rate gas discharge laser UV light source comprising a gas discharge chamber including an elongated gas discharge region defining a longitudinal discharge axis, comprising the steps of:

randomizing the gas discharge pulse repetition rate over time within a burst o pulses, while maintaining an average gas discharge pulse repetition rate over time.

99. (withdrawn) A high power high repetition rate gas discharge laser UV light source comprising:

an elongated baffle plate having a longitudinal axis comprising:

a base plate;

a plurality of pyramidal structures including varying numbers of generally pyramidal elements and oriented in groups of varying numbers of generally pyramidal elements and oriented along and transverse to the longitudinal axis.

100. (withdrawn) A method of producing gas discharge laser output light pulses comprising:

reducing acoustic resonance by introducing artificial jitter into the timing of laser discharges to vary the inter-pulse period of the laser output light pulses from pulse to pulse within a burst of pulses randomly or in a repeatable pattern within a burst.

101. (withdrawn) The method of claim 100 further comprising:

the variation is on the order of 1/width of a resonance peak.

102. (withdrawn) A gas discharge laser output light pulse producing system comprising:

a set of paired elongated electrodes defining an elongated discharge region;

a preionization tube upstream of the gas discharge region;

a preionization mask covering the preionization tube to substantially prevent preionization upstream of the discharge region.

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Examiner: Dung T. Nguyen

Group Art Unit: 2828

Conf. No.: 7575

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPLICANTS' APPEAL BRIEF

(9) Evidence Appendix

None.

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(10) Related Proceedings Appendix

None.